The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers, Limited

VOL. XLIII. NO. 1113 — October 26, 1940 — Annual Subscription, 21s. Overseas, 26s.

Management Problems

EMPHASIS is placed in the Press and in ministerial speeches upon the importance of the manual work that is now being carried on under war conditions and without doubt this is justified by political considerations. Nevertheless the rôle of those who do not work with their hands, but who must exercise the authority of management, must not be overlooked. The management is the mainspring of whatever success the national effort achieves, and only those engaged in this task can know the multiplicity of urgent problems to which attention must be given. Of all the attributes of management that of looking ahead and foreseeing, and planning for, eventualities is perhaps the most important. Generalship on the Home Front may be likened to the playing of chess. The adversary is manifold, however, and consists of the action of the enemy, the reactions of the workers and others, the exigencies of plant operation, the state of the markets or other demands for products, and—most incalculable of all—the slings and arrows of outrageous fortune. Some of the problems which the higher management is now facing may be very briefly mentioned here.

The importance of the export drive has been emphasised by the Government, and it was with some disappointment that one noticed the recent suggestion—which one hopes is not justified—that our efforts in this direction had become reduced. With an expenditure of £9,000,000 a day on war efforts, the need for currency to pay for this colossal expenditure must be evident. The drive which an experienced cabinet minister can give to any particular war effort has been exemplified by the increase in munitions production; if our export drive is wilting, is it because the Government has left it to individual concerns to obtain the orders? It was specifically laid down when the export groups were formed that the Government would not obtain orders, but would "lubricate" the supply of materials to fulfil them and be of indirect assistance in obtaining orders. If it is true that the export trade is not obtaining the orders that are desired, is it due to the fact that industry has been left too much to its own devices? A single directing head of the export drive would achieve far more than all the export group committees put together.

That brings up the point also that the export drive has its repercussions on foreign trade. Foreign trade is competition between nations. Individual firms can compete with claw and fang without anyone being one penny the worse; but when nations begin to do this, wars result. One of the causes of this war has been stated to be the acute competition in foreign markets due to the attempt to cure unemployment—a management problem if ever there was one. The Nazis solved this problem by preparing for war while piling up indebtedness which they could not pay, on the assumption that the vanquished would pay. This indebtedness after the war will be a terrible problem for, without conquest, the Germans will lose the accumulated savings of their years under the Nazi locusts. This inherent difficulty of foreign trade brings in its train certain dangers in an unrestricted export drive, and one of the needs of the times is to correlate our export drive to our foreign policy. It is evident that direct Government direction of the export drive is necessary if our present methods are not achieving adequate results.

The effects of the purchase tax have not yet been seen. It is easy to restrict expenditure but unless steps are taken to reabsorb both the labour and the plant thus rendered idle and unproductive our last state will be worse than our present one. This reabsorption must be the responsibility of the Government, and however vital it may be to our war effort the nation cannot with equanimity see valuable peace-time industries closed down, probably permanently. Some alternative employment must be found for these firms, not only for their employees, and unless that employment can be provided more harm than good will have been done.

The problem of keeping the labour forces of this country healthy and in good spirits during this period when everyone is in the front line is another urgent problem of management. A company of soldiers is together and forms a group of comrades without responsibilities other than the immediate task of fighting the enemy. Periodically, and when circumstances permit, they are withdrawn to the rear for a complete rest. The industrial worker under present conditions is in considerable danger both at his work and during his leisure hours. He has few, if any, periods of complete rest. He returns home after his work to confront whatever domestic problem the war and the normal—or abnormal—exigencies of life have brought; he is, therefore, bearing a double burden. It is one of the tasks of the works management and more particularly of the Government to keep the inevitable worries of the times from weighing too hardly upon the individual. That is a task of no small magnitude in the light of the personal nature of the problem. One can only expect the Government to proceed along general lines and leave the management to assist with the personal problem. Government and works management are two facets of the same stone, different in size, but equally part of an indivisible whole.

NOTES AND COMMENTS

German Chemicals and Air Attack

IN a recent issue the *Manchester Guardian* published an interesting article from its scientific correspondent summarising the facts currently known about the chemical industry in Germany. A long list of substitute materials is contained therein, as might be expected—substitute fuels, substitute waxes and oils, *ersatz* textiles, synthetic fodder and the like—but of more cogent interest are the writer's observations concerning how the German chemical industry is standing up to the attacks of the Royal Air Force, and, still more important, how it is likely to meet the continued pressure of bombardment from the air. In the first place it is noteworthy that even before the industry was thus attacked accidents to industrial workers were on the increase, and that every German worker was, on the average, losing more than two weeks a year through sickness. A second vital point is that the German chemical industry was an extremely highly organised institution, which worked magnificently—no doubt better than ours—provided that its organisation was not interfered with. It can hardly be doubted now that this organisation has been interfered with, and it is logical to assume that the efficiency of the industry has thereby been impaired. The effect of the proverbial "spanner in the works" is well known, and it will be universally conceded that the R.A.F. have dropped rather more than a spanner into certain works. The splendid response of the British chemical industry to air attack is common, and very welcome, knowledge; but a delicate organism like the German industry is unlikely to have the same recuperative powers.

Coal Tar Dye Exports from Central Europe

ACCORDING to trade reports of the U.S. Department of Commerce, Germany remained by far the largest exporter of coal-tar dyes to the United States in the first half of 1940, accounting for 59 per cent. of the total as against 64 per cent. in January-June, 1939. Switzerland, as usual, occupied second place, with a quota of 33 per cent. (last year 32 per cent.). The totals which these percentages represent were, however, on a considerably smaller scale than last year. Germany, for example, exported over 2,989,000 lb. in the first half of 1939, but only 606,500 lb. in 1940, while the corresponding Swiss totals were 1,042,000 lb. (1939) and 339,500 lb. (1940). Exports from the United Kingdom in the same periods were 48,500 lb. and 25,000 lb.—a more or less proportional decrease. A noteworthy feature of the monthly totals is the steady decline in imports from Germany, which started at 131,261 lb. in January, 1940, and finished at 74,544 lb. in June; the Swiss figures declined from 78,653 lb. in January to 36,425 lb. in June. No comment on these figures is made in the report, and the monthly totals of imports from the U.K. are not stated, but it is significant that while the Swiss and German totals are respectively about 33 per cent. and 10 per cent. lower than the figures for the poor trade year of 1938 (January-June), the British figures are five times greater.

Fatty Acids from Coal

THE problem of the production of soap and butter, both in war time and under artificial conditions induced by a self-sufficiency economic programme, have always created an intense interest in the lesser known reactions of chemical synthesis on the part of Central European chemists. Official data published in Germany before the war showed that the national production of fats was between 41 and 48 per cent. of the consumption during the period 1932-36. It is not surprising, therefore, that artificial methods for the production of these fats which are later to be manufactured into soap and butter should have been actively pursued in Nazi Germany. So long as the principal source of paraffin hydrocarbons was petroleum, the process was largely of academic interest, but with the synthetic production of hydrocarbons rendered possible by the newer methods of Fischer and Tropsch, the way was open to industrial exploitation both as a war measure and as a means of economic self sufficiency. Captain W. H. Cadman mentioned at a recent Institute of Fuel meeting that when in Germany before the war he had used synthetic soap made from coal and had eaten synthetic butter derived from the same material.

Butter and Edible Fats from Coke

SOME particulars of the method used, in so far as they have been allowed to become public, have been given by E. Lemaine (*La Génie Civil*, CXV, 413), based on a communication by Dr. Wietzel to the Verein deutscher Chemiker. The first stage is production of coke from coal followed by the production of water gas from coke, the gases being then enriched with hydrogen to form the proper synthesis mixture for the Fischer-Tropsch process. Paraffin hydrocarbons obtained by the Fischer-Tropsch synthesis are oxidised by treatment with air under pressure in a column which is water-cooled to keep the temperature of the exothermic reaction within the desired limits. A portion of the products escapes in gaseous form with the air and is condensed, the remainder being withdrawn from the base of the column. The products of oxidation which consist principally of fatty acids are then saponified by alkaline hydroxide, after which a first separation of unsaponifiable matter is effected at 60°-80° C. by some suitable solvent such as a mixture of propyl and butyl alcohols, the remainder of the unsaponifiable matter being separated by distillation at temperatures between 300° and 400° C. Through experience gained in the high-pressure hydrogenation of coal and tars it has been found possible to reduce the unsaponifiable content of the product to one per cent. or less. These unsaponifiable products of the reaction are distilled to recover the solvents. The product of saponification now consists of a complex mixture of several different soaps which is acidified by mineral acid and the fatty acids are salted out. The crude acids are then vacuum-distilled in two stages with a yield of some 50 to 80 per cent. of the crude fatty acid, the remainder being unsuitable for the manufacture of soap, generally on account of its odour. The stages by which these synthetic fatty acids are converted into edible fats does not appear to have been made public so far as can be discovered. But perhaps the world has not lost anything thereby, for Captain Cadman reported that the taste of the synthetic butter was unlike anything he had ever experienced.

AS A WAR-TIME MEASURE for expanding the domestic casein supply to the utmost, the German Government has undertaken to subsidise production of crude casein. The subsidies will be paid to casein processing plants.

IMPORTS OF SODIUM SILICOFLUORIDE (fluosilicate) into the U.S.A. from Germany have decreased from 700,000 lb. in 1939 to zero in 1940. It is noticeable, however, that 264,500 lb. were imported from Portugal, a new source for this commodity, in January-June, 1940.

NEW APPLICATIONS FOR PYRIDINE

A Growing Field in the Dyestuffs Industry

by G. S. RANSHAW

IT is some twenty-eight years since Freiberger suggested the use of heterocyclic bases, especially pyridine, as printing assistants and solvents for acid and substantive dyestuffs. During that time they have continued to be used, but had lately been overshadowed to some extent by the more specialised assistants to which considerable publicity has been given. This tended to divert attention from products developed on a pyridine basis, with greatly improved characteristics, but recent new processes have brought this useful chemical into the limelight again.

Pyridine itself is able to augment the degree of dispersion of most dyestuffs (it is not used with the Naphthol AS series), while it also has a solubilising action on the natural waxes, oil and grease that are usually associated with textile fibres in the "grey" state. Thus it was early applied with success both for the preparation of printing pastes and for dye-baths; especially was it advantageous in the printing of wool with acid and substantive colours, since brighter shades were obtained and it was possible to employ certain dyestuffs which were otherwise unsuitable.

Improving the Wetting Power of Pyridine

Nevertheless, pyridine has the drawback that it possesses no appreciable wetting power, and as early as 1925 the use of pyridine or its homologues in association with the sodium salt of isopropyl or dibutylnaphthalene sulphonic acids was suggested. The wetting power of these alkyl naphthalene derivatives originally gave rise to the production of the "Nekals" and is utilised in many assistants to-day; the addition of pyridine apparently has the effect of greatly increasing this property. In addition, the comparatively recent development of other classes of assistant possessing additional useful properties has enabled several interesting products to be manufactured on a pyridine basis, and these deserve attention both on account of their cheapness relative to some of the more specialised agents, and because of the numerous directions in which they can be applied. These products are all brownish liquids, soluble in water and with a *p*H of 7-8. They are principally used for wetting out goods previous to dyeing, as additions to the dye-bath, for the after-treatment of dyed fabrics, and for the preparation of printing pastes. In addition, the use of both pyridine itself and the pyridine/alkyl naphthalene sulphonic acid type of assistant has proved advantageous in the making of size mixings for cotton goods, whilst special products are directed towards obtaining uniform results on hard-twisted yarns, denser structures such as the felt in hat bodies, and the seams of rayon and cotton hosiery. A recent product can be used with confidence wherever absolute resistance and stability to acid conditions are required.

The function of such products in the treatment of goods previous to dyeing is to remove from the fabric foreign bodies such as oil and grease, thereby loosening the dirt usually associated with them. This enables a uniform material, on which level results may more easily be obtained, to be presented to the dyestuffs. This is specially important with delicate wool yarns such as zephyrs, with viscose and cuprammonium rayon, as well as with all types of yarn in package form. The dyer of woollen piece goods, too, profits by a preliminary treatment consisting of running the goods through a bath containing ½ to 1 grain of pyridine or pyridine-containing assistant per litre, together with 1 or 2 c.c. of 30 per cent. ammonia solution.

Pyridine in the Dyehouse

It is in the dyehouse that assistants based on pyridine can be used most advantageously. Here the solubilising and dispersing power of the pyridine comes into play, enabling the dyestuff to be absorbed more completely and uniformly by the fibre. This means a clearer shade and a more level result—an especially important factor when dyeing with difficult dye combinations, and in the dyeing of closely-wound yarn packages where a fine and uniform dispersion of the dyestuffs is an essential. Unevenly dispersed liquors lead to unevenly dyed yarns, shades that turn rusty, and colours that easily mark off owing to insufficient penetration of the liquor. There are also economies to be realised when using fewer dispersions, in that dyeing time is reduced and excess colour is not carried out of the bath by the goods.

Especially is it necessary to obtain complete solution of the dyestuff in the case of wool treated with acid wool colours, or where an after-chroming process is used. Such solubility is obtained by pasting with a 1 in 10 solution of a pyridine-containing assistant, pouring on hot water, and finally bringing the solution to the boil if necessary. Sulphur dyes are preferably pasted with a 1 in 10 solution, after which sodium sulphide, soda, and hot water may be added. Indanthrene and other vat dyestuffs are pasted with a 1 in 10 pyridine solution, and after thinning with water are vatted with soda and hydrosulphite in the usual way. In the rinsing of yarns and piece goods previous to drying, *i.e.*, after dyeing, the addition of a little tetracarnite (½ to 1 grain per litre) or other pyridine-containing assistant has the advantage that any dyestuff which is insecurely anchored to the fibre, being merely attached to the surface, is removed. This gives a result which is faster to rubbing.

Use in Printing Pastes

Turning to the production of printing pastes, it may be said that the essential task of the thickeners used is to modify the diffusion process normal to the dyestuff, thus restricting the dye to selected areas of the fabric and restraining it from diffusing into areas which are to be left virgin. Nevertheless, the complete and ready absorption of the dye in the selected areas is essential, a state of affairs possible only with a homogeneous and finely dispersed liquor and in the absence of phobic substances such as oils and grease in the thickening itself and on the fabric. The addition of one of the pyridine-containing assistants to the thickening, *i.e.*, to the dye pastes—ensures this on account of the solubilising and dispersing action of the pyridine and the wetting power of whatever assistant is found in association with it. In addition the weak alkaline reaction of the pyridine with organic acids causes salts to form which gradually split off when the cloth is in its damp condition, thereby prolonging the fixing process, while the slow rate of evaporation of the pyridine helps the colour to penetrate more intensively into the fibre and its hygroscopicity ensures the right moisture content for fixing.

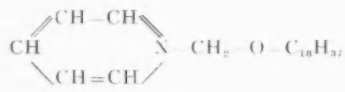
More recent applications of pyridine in conjunction with other textile assistants include pyridine associated with a sulphonated fatty alcohol and one including a sulphonated fatty acid. The former possesses a combination of the properties of both pyridine and a typical sulphonated alcohol, namely, it is capable of good penetration into the goods and gives them a soft handle. It is preferred for use with hard-twisted rayon and cotton yarns, in dyeing cotton drills, and in dyeing hosiery (uniformity of shade between seam and welt). It can also be recommended for use in dyeing felt hat bodies. The fatty acid combination is for use where absolute resistance to acid is required.

When pyridine is mixed with certain types of substance it reacts by simple addition to form a compound which is often water-soluble and in which the nitrogen atom is penta-

instead of tri-valent. Thus, the essential constituent of "Velan" (I.C.I.'s outstanding waterproofing agent) is chloromethyl octadecyl ether or closely related derivative having the formula :—

$$Cl.CH_2-O-C_{18}H_{37}$$

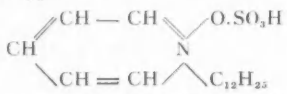
This body has the property of reacting with textile fibres, notably cotton and viscose rayon, to form chemical compounds which are water-repellent. Unfortunately, chloromethyl octadecyl ether, a fuming liquid, is not suitable for direct application to textiles, but with pyridine it forms a water-soluble substance which is applicable by the ordinary processes. Velan, therefore, is of the following type :—



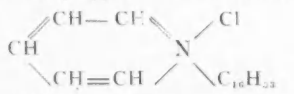
from which it will be observed that the nitrogen is pentavalent.

When the textile material is padded with an aqueous solution of the above product, then dried, and baked at 105° to 110° C., pyridine and hydrochloric acid are split off (sodium acetate is present to neutralise the latter) and the residue becomes firmly fixed to the fibre.

Auxiliaries of the type



have proved most successful. This is a pyridine compound of sulphonated lauryl alcohol and being of the cation-active type of body it is used with titanium pigments to effect the delustring of rayon piece-goods. Another well-known I.C.I. product is "Fixanol," used to increase the fastness of ordinary direct dyeings on cotton and viscose rayon. This also is a pentavalent nitrogen compound based on pyridine, and is known as cetyl pyridinium chloride :—



Finally, pyridine can, by reduction, be converted into piperidine, which can be used in much the same way as pyridine, although it is more expensive. Sufficient has been said, however, to indicate the varied uses to which pyridine is put in at least one industry, and a combination of circumstances is bringing it to the fore again now that certain other products are unobtainable.

Utilisation of Waste Lignin

Recent Progress in New Methods

BOTH in Canada and the U.S.A., as also in Japan and other parts of the world, considerable research has been directed in recent years to finding new commercial outlets for lignin and its derivatives. Some success has lately been achieved by means of hydrogenation, especially in conjunction with the butyl alcohol pulping of wood, whereby lignin is removed in a comparatively unchanged condition, free from inorganic salts. Thus, it has been found possible to convert 40 per cent. of by-product lignin into aromatic oils by direct distillation, and a further 30 per cent. by hydrogenation.

It has been estimated that the pulping liquors from the paper industry alone can supply 1,500,000 tons of lignin per annum, and several additional million tons could be obtained from forest and sawmill waste. Botanically lignin is an important constituent of the cell wall, of the same order as cellulose, and probably linked in some way with it; but its precise chemical structure is equally unknown, although some light thereon has been thrown by the above-mentioned process of hydrogenation.

Lignin from Hardwood

This process, as developed by E. E. Harris and co-workers of the U.S. Department of Agriculture (Forest Products Laboratory) and described in *J. Am. Chem. Soc.* 1938, *60*, 1467, was found to proceed readily enough with the lignin in anhydrous dioxane solution or suspension, at a temperature of 250° C, and under a pressure of 200-350 atm. of hydrogen, during a period of about 18 hours. The catalyst used was copper-chromium oxide. The products obtained in this way were in good yield, and included up to 26 per cent. methyl alcohol, 38 per cent. propylcyclohexane and derivatives, or in some cases more than 60 per cent. of a high boiling resin. The lignin in this instance was obtained from hardwood by the action of methyl alcohol and hydrochloric acid, and identified products amounted to almost 80 per cent. of the starting material. In connection with the high yield of the last named product (resin of high b.p.) it is of interest to note that the Menasha Co. has recently installed a large plant to make plastic material from sulphite lignin at about one-third the cost of similar plastics. Lignin obtained in other ways than with acidified alcohol, *e.g.*, that isolated from soda pulping liquor or by sulphuric acid from other soft or hard woods, could be readily hydrogenated.

Development of Plastics

Several attempts have naturally been made to utilise sulphite liquors in various ways, *e.g.*, as fertilisers with or without admixture of ammonia compounds; as fuel to supply steam for the pulping operations; and as road binders; also for the manufacture of alcohol, but with little success here until hydrogenation showed a more promising way. Reference has been already made to its use for plastic manufacture. Several new types of plastic material have been in fact developed. One method is described in U.S. P. 2,146,655 (Forest Products Lab.), wherein sawdust or wood flour is hydrolysed, the resulting material ground to a fine powder, mixed with a plasticiser, and then moulded under pressure and heat into dark-coloured lustrous articles. In U.S. P. 2,077,884 (G. C. Howard), the product resulting from the action of alkali and heat on the calcium salt of lignin sulphonic acid is compounded with wood fibre, whereby laminated sheets and strong hard boards may be produced. In U.S. P. 2,168,169 (Mead Corpn.) the lignin resulting from the soda liquors of pulped hardwood, by precipitation with carbon dioxide, has given rather promising results because of its enhanced chemical activity. Other uses include tannin substitutes, water softeners, additions to cement to increase water-holding properties, and depolarisers in negative plates of storage batteries with great increase in output at temperatures below zero. The manufacture of vanillin from lignin is by now well known, but its use in this direction, as in some others, is limited by the comparatively small market. The greatest promise seems to lie in the direction of a cheap and commercially feasible method of hydrogenation, the prospects of which appear to be eminently hopeful. This would undoubtedly open the way to the production of many valuable organic compounds.

Literature recently distributed by Messrs. NEGRETTI and ZAMBRA, Holborn Viaduct, London, describes and illustrates their Recording Pyrometer, Pyrometer Controller and Multipoint Temperature Indicator.

Association of British Chemical Manufacturers

War-Time Work on Information, Exports and Man-Power

THE 24th annual general meeting of the Association of British Chemical Manufacturers was held in London on October 10, under the chairmanship of Mr. R. Duncalfe. In moving the adoption of the annual report for the year ending May 31, 1940, the chairman began by calling members' attention to the fact that the report was reduced in volume as compared with previous years and had been strictly confined to items considered necessary as a record.

"When we met a year ago," Mr. Duncalfe continued, "we had just been plunged into war, and since then we have passed through a year more pregnant with great events than any similar period of the world's history. We have had to face unimagined disasters to the Allied cause. The greater part of Europe has been overrun by our relentless enemy so that to-day we stand alone as the bulwark of freedom in Europe, dependent under Almighty Providence on our own strength and courage, but united as a nation as never before in our history and determined throughout the Commonwealth to pursue the task to which we have set our hands until such time as ultimate victory is achieved.

"The vital part which chemical industry must play in the war effort of the nation is recognised on all sides, and in particular by the government; the report gives only a brief summary of our work within that field; indeed, it would be impossible to include within the scope of any report all the manifold activities of the chemical industry under war conditions. Suffice it to say that on this occasion we were better prepared and organised for the task which lay before us than we were in 1914, and that, to the best of my knowledge, our industry has found it possible adequately to meet essential national requirements as these have developed up to the present time.

"We have recently had to suffer the full rigour of the enemy's air attack. Bombs have fallen on our factories and our personnel, but the work of essential production goes forward and our workers are still undismayed. I am sure you would wish to send a special message of sympathy to such of our members as have suffered injury to valued personnel or to undertakings the growth of which, often from small beginnings, it has been their pride to foster. The former losses are the harder to bear because material losses can be replaced and where necessary we have the requisite determination to rebuild anew.

"Six months ago your Council had, at the request of the Minister of Supply and of Lord Weir, Director-General of Explosives and Chemical Supplies, to face the heavy responsibility of deciding at almost a moment's notice on the release of our General Manager, Mr. J. D. Pratt, to fill an important post in the Ministry, namely, that of Deputy Director-General of Explosives and Chemical Supplies. It was made perfectly clear at the time that this request did not constitute any reflection on the important work of this Association in organising the chemical industry, but that Mr. Pratt was considered to be the one man particularly suited by training and temperament to fill the position to which he was appointed. In making this sacrifice, I think we can take legitimate pride in the fact that we were able to provide the man considered most suitable for this post and to second him for Government service in an unpaid capacity.

The Weekly Bulletin of Information

"The exigencies of war and the special legislation which followed it, including a spate of government regulations and orders affecting our industry to a vital degree, have required the closest attention, and these, coupled with the expansion of the civil service, constantly changing officials, and new men in new jobs, have together presented a host of problems with which we have grappled in the interests of our members. In our weekly bulletin we have endeavoured to provide a useful channel of information, and this new departure which, so far as my knowledge goes, is in its scope unique in trade organisations, has, I believe, been appreciated in the wide circle of our membership and has proved of great value.

"Another feature of the year has been the extent to which questions relating to man-power, quite apart from wages and conditions of service which we have always regarded as the functions of employers' organisations and which we have never touched, have occupied our attention. I refer to such matters as the Schedule of Reserved Occupations, deferment of calling-up notices, migration of labour, etc. We have recently thought it desirable to appoint a Joint Committee to consider such matters in collaboration with employers' organisations in our industry and to provide for the necessary co-operation.

Mr. R. Duncalfe

"The chemical industry has, during the year, played its full part in the export drive, and a number of export groups have been formed under the direction of the Export Council and are now functioning fully. While these export groups are self-supporting and autonomous and are open to non-members of the association, it has been found convenient to service them, in many cases, from 166 Piccadilly, with the aid of our trained and informed staff. I believe that this has proved to be of considerable benefit to the export groups themselves and to our members who comprise so large a portion of their membership.

"Recent contact has merely served to confirm and strengthen the opinion I had previously formed as to the soundness of the association's organisation, but the various developments mentioned in the annual report and those to which I have specially referred have cast a heavy burden on our staff, often working under conditions of considerable difficulty, and that burden has been increased by our action in seconding the general manager to the Government service. I have had exceptional opportunities during the past months for close contact with our staff, and I should be lacking in my duty if I failed on this occasion to pay a special tribute to the devotion and ability in which they have taken the strain. Mr. Drake and Mr. Holden have been twin towers of strength, but I know they would wish me to make it clear that my remarks apply not only to them but to all the members of their staff.

"If I may now be permitted to strike a personal note it is merely to say that it was with some diffidence that a year

ago I accepted the chairmanship under the stress occasioned by war conditions. That diffidence was prompted by the feeling that the national interest and that of our industry during war perhaps rendered it advisable that this chair should be occupied by someone more closely related to the main channels of chemical industry than I myself could claim to be; had I known what lay before me that diffidence would have been even more pronounced. If, as I hope, I have been able to carry out the duties of my office over the past year to your reasonable satisfaction, it will have been mainly due to the unqualified support and willing help I have received.

"The tasks which lie before us now are heavy, but our path of service appears to be clearly marked. Surely, it is to place our great industry at the disposal of the nation without measure and without stint. I am profoundly convinced that just as the nation is united so are we united in that determination. I believe in the destiny of our race; I believe in the future of this association and in its capacity for useful service, and I face the future without fear."

Points from the Report

An important feature of the year's work has been the weekly bulletin which at the outbreak of war replaced the monthly summary of information. The objective was to keep members more promptly informed of all new government orders, regulations, import and export changes and similar matters of immediate concern, and to save their time in studying individually the mass of government publications to discover which were likely to affect them.

In conformity with the wish of the Export Council that Export Groups should be based as far as possible on existing trade associations, a Fine Chemical Export Group and a Pharmaceutical Export Group were initiated by the association. Three affiliated associations combined together to form a Pest Control Chemicals Export Group, and another affiliated association form a Pigment Colour Makers' Export Group. Although quite independent of the association, all these groups work in the closest co-operation with the association, and operate from the same address, where the office accommodation and staff have had to be enlarged to cope with the work. A Chemical Plant Export Group was inaugurated, but later joined a larger plant and machinery export group as a sub-group. A Dyestuffs Export Group operates from Manchester with the same Secretary as Group D of the Association, although independently of the Group. A Heavy Chemical Export Group is also operating in liaison with the Association.

Key Industry Duties

Activities in connection with the Fine Chemical Group have been specially extensive. Key industry duties came under the virtually unilateral control of the Board of Trade by the emergency legislation. In practice, however, the Board has broadly maintained the old principles. At the instance of the Association, the Board agreed to shorter periods of extension of the temporary exemption of K.I.D. chemicals from the duty. Thus the maximum benefit of the duty operates as soon as practicable after the exempted item comes into production here. The significance of the key industry duties has been largely diminished by the listing of the majority of imporant imported K.I.D. chemicals as requiring individual licences. The list in question was prepared by the Association at very short notice and was accepted without significant alteration by the departments concerned. Early in the year an inquiry was made into the prospects for British manufacture of chemicals which were not being made here or were being made in inadequate quantity. The Advisory Research Council of the Chemical Society provided a supplement to this. It undertook to investigate how far research laboratories could be put on to evolving practical processess for the manufacture of specially involved products or, where appropriate, making the products themselves where the demand was relatively small.

The Tar Products Group of the Association has acted wholly with the Association of Tar Distillers in dealing with the many problems which have arisen with the war. These have included, *inter alia*, (a) a considerable expansion of the pre-war planning against the many possible results of air attack; (b) the effective use of coal tar products; (c) the operation of the control scheme introduced in respect of benzols, naphthas, and toluene; and (d) the production of naphthalene and anthracene in the much increased quantities required under war conditions. In the early months of the war, the Mines Department appointed, *inter alia*, a High Temperature Carbonisation Committee "to consider and examine the possibility of increasing the amounts of liquid products obtained by high-temperature carbonisation in gasworks and coke ovens and the most advantageous means of utilising such products in war time." Mr. Pratt, the general manager, was asked to serve on the committee and to be its chairman, an office which he relinquished when he was seconded to the Ministry of Supply. This committee has done and, under the chairmanship of Mr. W. G. Adam, is still doing valuable work for the mines department and the tar distilling industry.

The Association has continued the Quarterly Safety Summary and Safety Circulars dealing with accidents and information of interest on the technical side of safety in the chemical industry. Safety precautions are even more important in war time than in peace, and the Association hopes to continue its safety work for this reason. The collection of accident statistics has been suspended during the war, together with the revision of Part II (Detailed Instructions) of the Association's Safety Rules for Use in Chemical Works.

Reserved Occupations

The Association's application for a reduction in the reserved age of process men in the fine chemical industry from 30 to 25 was successful. A similar application by the Association of Chemical Employers in regard to process men in the dyestuffs and heavy chemical industries was also successful. To prevent overlapping and to secure mutual support, a Joint Committee has been formed with the Association of Chemical Employers, the Drug and Fine Chemical Manufacturers' Association, and Imperial Chemical Industries, Ltd., to decide the best method of dealing with production matters lying outside negotiations with trade unions—such questions for instance, as the Orders affecting transfer of labour and industrial registration.

Exemption from the Purchase Tax of products such as disinfectants, insecticides, sheep dips and costly synthetic drugs has been secured. These exemptions were continued in the graded tax scheme which replaced the original scheme.

Because of emergency work the 1939 edition of the Association's main Directory, due in January, 1939, could not be issued until September, but it is hoped to revert to the normal sequence again by an issue early in 1941. A revision of the Directory of British Fine Chemicals was undertaken at the special request of the Ministry of Supply, and the new edition was issued in April, 1940.

Council for the Coming Year

The constitution of the Council for the ensuing year will be as follows:—

President: Mr. E. Wallace; *vice-presidents*: Dr. E. F. Armstrong, F.R.S., Dr. F. H. Carr, C.B.E., F.I.C., Sir Christopher Clayton, C.B.E., Ph.D., F.I.C., Mr. E. V. Evans, O.B.E., F.I.C., Mr. C. A. Hill, B.Sc., F.I.C., Sir David Milne-Watson, Bt., D.L., LL.D., Mr. R. G. Perry, C.B.E.; *Honorary Vice-presidents*: Sir Martin O. Forster, F.R.S., Mr. N. N. Holden, Lord McGowan, K.B.E.

Elected Members: Chairman: Mr. R. Duncalfe; vice-chairman: Mr. C. F. Merriam; honorary treasurer: Dr. P. C. C. Isherwood, O.B.E., F.I.C.; members: Mr. F. W. Bain, M.C., Mr. T. H. Board, Mr. G. E. Howard, Mr. H. Jephcott, Major T. Knowles, Mr. W. F. Lutyens, Mr. L. P. O'Brien, Mr. J. H. Olliver, Mr. D. J. W. Orr, Mr. A. E. Peak, Mr. F. M Roberts, Mr. K. H. Wilson, Mr. W. J. U. Woolcock, C.M.G., C.B.E.; *co-opted members*: Mr. C. E. Carey, Dr. A. E. Everest, F.I.C., Lord Trent. There is one vacancy for a co-opted member.

Notes from Works Safety Jottings

The Use of Colour and Other Simple Devices

by JOHN CREEVEY

DEVICES and equipment can be obtained to minimise and often completely avoid all common hazards, so far as that is possible in view of the failings of hands, eyes and mind. Some may not be too well-known; others are just passed by because there is a makeshift measure which has so far served its purpose quite well—seemingly. Some have come into being from sheer necessity at a particular works, where thought has been given to the problem with which the works were faced, and something has been designed and perfected, and then offered for the use of all who care to avail themselves of the experience of others. Others have been invented as a source of profit, in the knowledge that some such device or equipment was needed. In all cases information as to source of supply is available if search is made for it, so that there is really no excuse for failing to test and adopt a measure which may prove satisfactory.

* * * *

The use of a ladder clip which can be hooked over pipes to hold the ladder secure against slipping will greatly reduce accidents where fitters or painters are working among overhead pipes. Such clips can be made in the works by suitably shaping and welding ½-inch iron rod; they will be greatly appreciated when adopted. Simultaneously there is often need for an open-top tool basket, made up of fine-mesh wirework, which may be securely suspended from a pipe-line by similar means. Such a basket provides safety for tools which might otherwise find a temporary and precarious perch on a narrow ledge or across two adjacent pipes or in some equally dangerous position, as on a pipe bracket. Negligence in handling tools when working among overhead pipes can bring grave personal injury to persons below, and damage to plant is also possible, leading to additional hazards as a consequence.

* * * *

The practice of colouring pipe-lines as indication of what is passing through them is now adopted generally at chemical and allied works of all sizes, and is, indeed, essential where pipes are numerous. The same degree of attention, however, is not always paid to the valves, especially small valves serving accessory features of the plant. Colour is an indexing device of proved value which cannot be queried, for it claims instant recognition. Therefore, the wider use of coloured valve wheels could prevent many possible accidents and costly mistakes. Such wheels, made of moulded plastic composition, are now obtainable in standard colours, with or without standard service markings.

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Safety catches for flame-proof push-button switches controlling electric motors are to be highly commended as a means of safeguarding accidental or unauthorised starting. These catches are quite simple affairs, but are able means for locking the button on the starting switch, and their importance can be emphasised by painting them a brilliant red in contrast to pearly grey for the remainder of the switch. The provision of a plate which locks over the casing of the switch and completely protects the push buttons will give additional safety when repairs or maintenance are in progress; the wording, in red letters, is merely "Warning, Men Working," and the fixing and removal is best made a serious offence for anyone but the man in charge of repairs or maintenance work.

* * * *

Comfort, or rather ease, in working—with the minimum expenditure of energy—goes further in reducing certain accidents than might be imagined. For instance, the maximum height of the charging hole on a vessel, in relation to the floor on which the man will be standing, should never exceed 27 inches. This is simple advice, but it has been followed at some very large works, and there has been adequate proof of the manner in which avoidable weariness and certain types of accidents can be jointly eliminated. Easy accessibility for valves which have to be constantly operated is also very desirable. Both these points should be borne in mind when plant is being designed or re-erected to serve some new purpose. If the drawing-office man had to operate the plant for the rest of his days once the drawings were completed, he would find many minor features that might be fitted in better for general convenience. At large works a plant-design committee drawn from different directions among the personnel of the works will give much sound advice, and the expenditure of time in studying different aspects of the design at the drawing board stage will be well repaid in ultimate ease of operation and freedom from accidents of all classes.

* * * *

Electrical equipment always demands special attention from the safety aspect. Cables must be of safe current-carrying capacity; switch-gear, of adequate rupturing capacity. Power distribution must be properly planned, with control and overload protection upon all circuits. There should be overload and no-volt trips on all motors; likewise emergency stop push-buttons, of easy access and distinctly marked, for all line shafting and machinery which can become a mechanical danger. Isolating links in the circuits must be provided for safety when working on the line. Earthing for static discharge is very necessary; likewise the earthing of all metal parts which could become "live" by the breakdown of insulation. In addition, the whole of the electrical equipment should be under constant inspection.

* * * *

Common hazards involved in the removal of acids and other corrosive liquids from carboys are greatly reduced by use of syphoning devices or a carboy tipping device; of the former there are numerous patterns procurable, with different degrees of fool-proof means for starting and stopping the flow of liquid. The carboy tipper saves a considerable expenditure of energy and simultaneously avoids the danger of spilling quantities of corrosive in excess of mere splashes. Acid handling is liable to cause minor accidents in spite of all the care that is normally exercised. Where acids are much in evidence there should be a special set of regulations drafted to cover different contingencies, and failure to observe them must receive warning from someone in authority who is capable of giving this firmly but suitably to impress the culprit. Severe reprimand, with threat of dismissal, does not always serve its purpose in the matter of acid handling as it might do in failure to observe regulations concerned with moving machinery. There is an aspect of psychology about it, which has to be experienced to be fully appreciated.

* * * *

Wherever safety devices are installed on plant, opportunity of pointing out that they are accessory to the care to be exercised by personnel must not be overlooked. When safety devices are taken for granted as 100 per cent. efficient and unfailing in service against whatever may come, there is a tendency for the personnel to become less vigilant, and for accidents to increase, were it not for the excellent features of the device itself. However efficient they may prove to be, let them still be regarded as truly efficient only when in co-operation with personnel.

Midland Chemical Societies

New Appointments and Programmes

THE Midland Chemists' Committee, which is representative of the various chemical organisations in Birmingham and the Midlands, has issued its programme for the winter session, together with the names of the officials of the constituent societies. Mr. George King, for many years hon. secretary of the Birmingham and Midland Section of the Society of Chemical Industry, is the chairman, and Mr. R. S. Potter (38 Heaton Road, Solihull) continues as hon. secretary. Mr. J. R. Johnson is the chairman of the local branch of the Institute of Chemistry as well as chairman of the Midland Chemists' Committee; Mr. T. H. Gant, vice-chairman; and Mr. E. M. Joiner (15 Halton Road, Sutton Coldfield), hon. secretary. Mr. A. Churchman presides at the meetings of the Birmingham section of the British Association of Chemists, and Mr. J. K. Best (7 Hemyock Road, Wesley Hill, Birmingham) is the hon. secretary.

The Birmingham representative of the Chemical Society is Dr. S. Peat, of the University of Birmingham. Members usually meet at that University with the Birmingham University Chemical Society; and the opening meeting of the session was held on Monday, October 21, when the President (Professor W. N. Haworth) delivered an address on "The Constituents of Natural Phenolic Resins." Mr. R. A. Wilkinson (the University, Edgbaston, Birmingham) is the hon. secretary of the University Chemical Society. "Links in Nutrition" was the title of a paper contributed at a meeting of the Institute of Chemistry, the Society of Chemical Industry and the Food Group (Nutrition Panel) at the Birmingham Chamber of Commerce on October 23 by Mr. A. L. Bacharach.

The Birmingham and Midland Section of the Society of Chemical Industry have already arranged the following meetings: December 12, "Application of the New Lovibond Tintometer to Colorimetric Analysis" by Mr. E. Taylor-Austin; January 24, "Proteins" (Jubilee Memorial Lecture, S.C.I.) by Dr. W. T. Astbury; and March 21, "The Chemist in Modern Agriculture," by Sir E. J. Russell. Contributions will also be given by Professor W. Wardlaw (at the B.U.C.S.) and by Dr. C. M. Walter, of the Research Laboratories of the Birmingham Gas Department, and Mr. H. W. Homer, who will speak on "Formaldehyde" at meetings of the Society of Chemical Industry.

OCHRE MINES REOPENED

After having remained closed for sixty years, red and yellow ochre mines in Cornwall are being reopened with new plant and loading machinery, providing employment for about thirty men. There is a considerably increased demand for ochre, largely used in the making of paint, as a result of the stimulus given to the industry by camouflage requirements, and the Cornish Ochre Mines, Ltd., for which the managing agents are Messrs. Shearman and Co., of Tavistock, report that they have more orders than they can supply. The reopened workings appear to promise an almost unlimited yield, but the difficulty is in obtaining additional labour. The original workings, which were abandoned in 1880, consist of a main shaft about 40 feet deep and 20 feet in diameter, at the bottom of which there is a series of tunnels extending 200 feet or so between beds of red and yellow ochre, the quality of which is described as very good.

A.M.INST.CHEM.E. EXAMINATION

Under present arrangements the Associate-Membership Examination of the Institution of Chemical Engineers will take place in the usual way. Application forms for entry may now be obtained from the honorary registrar of the Institution. The home paper will be posted to candidates early in January and will be returnable by the end of March. The other papers will be taken on May 1 and 2.

Industrial Safety Service

Official Extension Plan

THE negotiations between the Ministry of Labour and National Service and the National Safety First Association are continuing. A basis for final agreement appears to have been reached. The suggested arrangement involves the devotion of the Association's entire industrial establishment to the production, on behalf of the Ministry, of the usual service of posters, bulletins and other literature, and its issue to a large number of factories as directed by the Minister of Labour and National Service. All the Association's existing industrial members and subscribers would be included under the scheme. The final arrangements for this wide extension of the Association's industrial service have yet to be completed, but members and subscribers will be notified immediately negotiations are concluded.

New Control Orders

Imports of Tin and its Alloys

IN future licences to import tin metal and alloys containing more than 50 per cent. of tin will be issued on the advice of the Non-ferrous Metals Control.

Applications for licences should be addressed in duplicate to the Non-ferrous Metals Control, Ministry of Supply, Grand Hotel, 46, Albert Street, Rugby, notwithstanding the direction at the top of the form that it should be sent to the Import Licensing Department. Importers are reminded that there is an Open General Licence for the import of tin in blocks, etc., from the British Empire (except Palestine, Hong Kong, and Transjordan).

British Chemical Prices

Market Reports

TRADE in general chemicals continues to pursue an active course and on the whole the market shows little change from the conditions reported last week. New business has been on a moderate scale and in the main restricted to quantities sufficient for immediate requirements. The price position is steady throughout, there being no outstanding changes in quoted rates to record. Business in coal tar products has been somewhat on the slow side this week and buying orders for cresylic acid and crude carbolic acid are on a small scale. Creosote shows a steady improvement and a fair interest in solvent naphtha is maintained.

MANCHESTER.—Fair quantities of a wide range of textile chemicals are moving into consumption in the Lancashire and Yorkshire districts and most of the other chief chemical-using trades are also taking reasonably steady deliveries. Few price changes of any consequence in the leading heavy products have occurred since last week. Fresh buying during the past week has been on a moderate scale. Among the by-products cresylic acid has met with rather more American inquiry and values have been about held, whilst the majority of the light materials are being called for in good quantities.

GLASGOW.—There has been a slight improvement in the Scottish heavy chemical trade during the past week. Prices on the whole still remain fairly firm. The export trade has shown a decided improvement inquiries being more numerous than for some time past.

Price Changes

Ammonium Chloride.—MANCHESTER: Grey galvanising, £19 to £20 per ton.

Antimony Sulphide.—Golden, 9½d. to 1s. 6d. per lb., according to quality. Crimson, 1s. 8d. to 1s. 11d. per lb.

Arsenic Sulphide.—Yellow, 1s. 9d. per lb.

Carbolic Acid.—Crystals, 9½d. to 10⅜d. per lb.; Crude 60's, 3s. 3d. to 4s., according to specification.

India-rubber Substitutes.—White, 5¼d. to 8⅜d. per lb.; dark, 5 5/16d. to 5 15/16d. per lb.

Lithium Carbonate.—7s. 9d. per lb.

Mineral Rubber, "Rupron."—£20 per ton.

Nitric Acid.—£21 10s. to £29 10s. per ton, ex works.

Potassium Bichromate.—Crystals and granular, 5d. per lb.; ground, 7d. per lb., carriage paid.

Pyridine.—MANCHESTER: 15s. 6d. to 19s. per gal.

Sulphur.—Finely powdered, £18 10s. per ton d/d; precip. B.P., £3 9s. per cwt.

Tartaric Acid.—MANCHESTER: 2s. 10d. per lb.

Vegetable Lamp Black.—£43 5s. per ton.

Latest Oil Prices

LONDON.—TURPENTINE, nominal.

HULL.—TURPENTINE, American, spot, 59s. per cwt.

PERSONAL NOTES

MR. N. W. PIRIE has been appointed head of the biochemical section of Rothamsted Experimental Station.

MR. BRIAN CRANSHAW, son of the principal of the Marple Printing Company's Aqueduct Works, where he is employed as chemist, has married Miss Yvonne Webb, of Marple.

The engagement is announced between MR. KEITH BLUNDELL JONES, B.A., and MISS PAULINE DAVEY. Mr. Jones, whose father is Principal of the Blackpool Technical College, is a supervising chemist, a position he has held since he took an Honours Degree in Natural Sciences until he joined the Royal Army Ordnance Corps this week.

MR. JAMES DONALD KIDD, M.A., M.Sc. (T.C.D.) and MR. EDWARD HENRY WATSON have passed the examination for the Fellowship of the Institute of Chemistry in the chemistry, including microscopy, of food and drugs, and of water. In addition the Council of the Institute announces that 39 candidates have qualified for the Associateship.

MR. ALBERT ERIC WALES, M.Sc., A.I.C., senior chemistry master of the Modern and Technical Schools, Scunthorpe, has been appointed head of the chemistry and physics department of Burnley Municipal College. Mr. Wales, who is 34, graduated with honours in chemistry in 1927 at the Leads University.

PROFESSOR A. V. HILL, O.B.E., Sc.D., LL.D., M.D., D.Sc., Sec.R.S., M.P., SIR FELIX POLE, and PROFESSOR SIR ROBERT ROBINSON, D.Sc., LL.D., F.I.C., F.R.S., have been appointed members of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research. DR. W. H. MILLS, F.R.S., PROFESSOR A. ROBERTSON, D.Sc., M.I.Mech.E., M.Inst.C.E., F.R.S., PROFESSOR SIR ALBERT SEWARD, Sc.D., D.Sc., LL.D., F.R.S., and SIR HARRY SHACKLETON have retired from the Council on completion of their terms of office.

OBITUARY

MR. ERNEST MILWARD, a director of Messrs. Pease and Partners and associated concerns, who in recent years had had charge of their coke-ovens, by-product plants and ironstone quarries, died recently at Darlington.

MR. ALFRED WILKINSON, V.C., died recently while working in the chemical laboratory at Plane Lane Collieries, Leigh, Lancs. He was in his 44th year and won the V.C. in the last war.

MR. ARTHUR CHARLES LATHOM, who died last week in Penrith, aged 79, had been for 52 years an active member of the chemical trade. Before establishing a chemical works in Darwen, Mr. Lathom was for 28 years proprietor of a chemical factory in Peterborough.

General News From Week to Week

EVANS CHEMICALS, LTD., of Boreham Wood, Herts., and the Mond Nickel Co., Ltd., of Bray Wick, Berks., have been elected members of the American Chamber of Commerce in London.

A SUPPLEMENT TO THE Schedule of Reserved Occupations is now available to the public at H.M. Stationery Office or Booksellers, price 3d. It sets out the changes made since the revision of the Schedule last May, up to August 31, 1940.

BENZOL AND BY-PRODUCTS, LTD., colliery owners, of Crigglestone, were fined a total of £100 at Wakefield last week on two summonses for permitting a glare to be emitted from a pit heap at Painthorpe. Arthur Plumstead, their employee, was fined £10 for aiding and abetting.

THE GENERAL OFFICES of George Cohen Sons and Co., Ltd., are now at Broadway Chambers, Hammersmith, London, W.6. (Tel.: RIVerside 4141). Their non-ferrous metals department and metal wharf, however, are maintained at 600 Commercial Road, London, E.14.

IRIS (SURREY), LTD., announce that meetings of creditors were called owing to the fact that their chemist (Dr. Ludtke) was interned some few weeks ago and it was felt by the directors that they could not carry on. However, since then arrangements have been made with another manufacturing chemist to take over, and they are of the opinion they will be able to carry on as soon as they have the accounts completed, these now being in the auditor's hands. They urgently ask for full statements of accounts up to and including September 30 last.

THE COUNCIL OF THE INSTITUTION OF FACTORY MANAGERS has decided to establish an Annual Silver Medal in honour of the first President, Sir Henry Fildes, M.P., J.P. The medal will be awarded this year for the best essay on some aspect of improved methods of factory management, and any factory manager in the British Empire will be eligible to compete. Essays, for which a length of 5000 words is suggested, should be sent as soon as possible, and in any case not later than November 30, to the Secretary of the Institution, Ashton New Hall, Ashton-on-Mersey, Cheshire.

Foreign News

THE POPULATION OF GERMANY, it is reported, has been given orders to gather wild nuts, particularly acorns, horse-chestnuts, and beech-mast for fodder and other purposes. The beech-mast, however, is already being used for the production of oil, so that the quantity available for fodder will not be large.

THE UNITED STATES CONSULATE at Georgetown, British Guiana, which was closed in 1933 for reasons of economy, has now been re-established.

A SULPHURIC ACID and chemical fertiliser plant has been established at Medellin, Colombia, with a capital value of 350.000 pesos (about £50,000).

THE RUMANIAN GOVERNMENT, says Reuter, has approved the export of a quantity of oil to Turkey, according to the *Universul* of Bucarest. This would appear to confirm the recent denial of the report that exports of Rumanian oil to Turkey had been banned.

ACCORDING TO THE *Indian Textile Journal*, Dr. S. S. Bhatnagar, Director of the Government of India Board of Scientific and Industrial Research, has prepared a note suggesting the use of pomegranate extract for the production of a substitute for mineral khaki dye.

INDUSTRIAL USERS OF CARBON BLACK, acetylene black, and lamp black in Germany must obtain permits for their purchases and consumption of these products if their quarterly requirement exceed 60 kilos. The Reich Board for Carbon Black is to exercise strict control over the distribution of the above commodities.

CONTRARY TO STATEMENTS which have appeared elsewhere, the Chilean Nitrate Sales Corporation reports that there is no difficulty in engaging shipping facilities for its markets. Although the European market is practically closed, shipments to continental United States, Hawaii, Egypt, and the Orient increased in the season ended June 30, 1940.

IT IS REPORTED FROM RUSSIA that a large new plant for dealing with the important deposits of molybdenum ore in the Caucasus was completed last month. The plant is situated near Nalchik, 10,000 ft. up among the N.E. foothills of Mount Elbrus, and is actuated by electric power derived from the Baksan and other rivers. Processing at the rate of 1000 tons a day is due to start almost at once.

SOVIET ECONOMISTS CALCULATE that the fertiliser to be produced by the new Chirchik chemical works in Uzbekistan, which were completed in September, will make it possible to increase the yield of cotton in the U.S.S.R. by an average of 4.85 cwt. per acre, which will enable the textile industry of the Soviet Union to turn out nearly 2188 million yards of cotton fabrics above the present annual output.

A VARNISH SUBSTITUTE, with a reduced content of linseed oil, has been developed in Germany, according to U.S. Consular reports. The material, which has been named "Eistan Firnis," is described as containing 50 per cent. fatty oil and a "large amount" of volatile solvent. Use of this substitute has been made compulsory for all external surfaces, except those with a red lead primary coat, when genuine linseed oil may still be used.

THE TOTAL VALUE of the secondary aluminium, antimony, copper, lead, nickel, tin and zinc recovered in the U.S.A. as metal and in alloys and chemical products amounted to $199,856,800 in 1939, according to the Bureau of Mines, U.S. Department of the Interior. Metals recovered from new scrap (materials produced as a result of manufacturing operations) were valued at $81,868,200 and metals recovered from old scrap (materials returned from use) were valued at $117,988,600.

THE PROBLEM OF CONTROLLING the potato beetle is still attracting much attention in Germany, notably in those districts adjoining the heavily-infected regions of Eastern France. Besides the organisation of field-watchers for destroying the actual beetles, and of zoologists and botanists for developing either a counter-parasite or an immune type of potato, the chemical industry has also come into the picture. Spraying the plants with a 0.4 per cent. lead arsenate solution and disinfecting the soil with carbon bisulphide have been the most efficacious chemical methods so far adduced for dealing with the pest; but this treatment is far from perfect and further research is said to be in progress.

Forthcoming Events

A JOINT MEETING of the Yorkshire Section and the Food Group of the Society of Chemical Industry will be held on October 28, in the Hotel Metropole, Leeds. The subject discussed will be "Standardisation of Tests for the Baking Industry," and papers will be read by Mr. S. Walter Butterworth, B.Sc. (Tech.), F.I.C., Department of Food Technology, College of Technology, Leeds, at 3 p.m.; by Mr. C. H. Fuller, B.Sc., A.I.C., Research Chemist, Messrs. J. Lyons and Co., Ltd., London, at 3.45; and by Messrs. H. C. Freeman, A.I.C. and W. P. Ford, M.A., A.I.C., Messrs. British Arkady Co., Ltd., Manchester, at 5.15. Members of the Institute of Chemistry and Fellows of the Chemical Society are invited to attend.

THE FIRST MEETING of the session of the Electrodepositors' Technical Society will take place at the Northampton Polytechnic, St. John Street, London, E.C.1, on October 28, at 3.30 p.m. A discussion on "Economic Methods of Degreasing Metals," will be opened by Mr. W. F. Jesson, B.Sc. The chair will be taken by the President, Dr. H. J. T. Ellingham. London members are asked to make a special effort to attend this meeting, which will conclude to allow plenty of time to travel home before the black-out. Employers are asked, where possible, to spare their men for some two hours to attend the meeting, the subject of which is of special importance in war-time. Tea will be served during the meeting and a large shelter is available. Visitors will be very welcome.

THE ANNUAL GENERAL MEETING of the British Cast Iron Research Association will take place at the Queen's Hotel, Birmingham, at 4 p.m. on October 30.

A MEETING OF THE CHEMICAL SOCIETY in Glasgow has been arranged for November 15, when Dr. W. T. Astbury will read a paper on "The Structure of Proteins" in the Royal Technical College at 7 p.m.

THE INAUGURAL MEETING of the British Rheologists' Club will be held in the morning of November 16 at the National Institute for Research in Dairying, Shinfield, Reading. The subject of the paper is not yet selected, but it will be followed by a discussion and luncheon. In the afternoon rheological apparatus used in the dairying industry will be inspected.

Chemical and Allied Stocks and Shares

FURTHER evidence of the ability of the stock and share markets to adapt themselves to meet the changes resulting from war conditions, maintained firmness in investment and other securities. Values were little changed, although the volume of business in evidence was again very small, and little selling was reported. In regard to many groups of industrial securities, the prevailing tendency is to await indications as to the full effects of the Purchase Tax, and also the Government's proposals in regard to insurance against air-raid damage to property. Shares of chemical and kindred companies reflected the steadiness of the stock and share markets, but in many directions quotations were not tested adequately by dealings.

Imperial Chemical at 27s. 6d. were unchanged on balance, while B. Laporte remained around 50s. and Fison Packard at 28s. Monsanto Chemicals 5½ per cent. preference continued to be quoted at 21s. 3d., and British Glues 4s. shares were around 5s. 6d. Business in the participating preference shares of the last-named company was recorded at 26s., and elsewhere Morgan Crucible 5½ per cent. first preference changed hands at 20s. 9d., while Sanitas Trust preference have transferred at 20s. 3d. Moreover, I.C.I. (Salt) 4½ per cent. debentures, which are tightly held and rarely change hands, have shown business at 96. Lawes Chemical shares remained around 7s. on the maintenance of the dividend, and in other directions Imperial Smelting were firm at 9s. 6d.xd. on the good impression created by the resumption of dividends. Hopeful views in regard to the forthcoming interim dividend assisted British Plaster Board, which were firm at 12s. The ordinary units of the Distillers Co. showed firmness at 56s. 6d., while Barry and Staines further improved from 25s. 7½d. to 26s. Lever and Unilever were good, having moved up from 23s. 6d. to 25s., the market now being more hopeful that an interim payment will be made. Moreover, British Oil and Cake preferred ordinary kept their recent rally to 23s. 1½d. Wall Paper deferred units reacted from 18s. 1½d. to 17s. 6d. on the full report, which indicates that although demand for wallpaper was surprisingly good in the past season, the restrictions in regard to paper are now affecting output. Pinchin Johnson were reactionary on the reduced interim payment, and on balance have gone back from 19s. to 17s. 6d. Turner and Newall were good, and, as compared with a week ago, have moved up from 62s. 6d. to 63s. 1½d. Associated Cement were 60s., and British Oxygen were firmer at 61s. 3d., as were British Aluminium at 38s. 9d.

On balance the majority of movements in iron, steel and allied securities, although small, were in favour of holders. Dorman Long were 21s. and Guest Keen 21s. 3d.; the interim dividend decision of the last-named company is due shortly. Stewarts and Lloyds were 39s. 1½d. Tube Investments 81s. 3d., and United Steel 19s. 3d. In other directions, Cerebos were firm at £7⅞ on the maintained interim dividend, and United Molasses showed firmness at 20s. 6d., while Dunlop Rubber were little changed at 30s. Textile securities were moderately lower, and Courtaulds were around 28s. 3d. Valor ordinary shares changed hands at 23s. 9d. Murex ordinary moved up to 70s.

Triplex Glass were 18s. and, among other glass shares, Canning Town Glass transferred at 5s. 6d. British Industrial Plastics shares changed hands at 1s. 10½d.; the financial results are due shortly. Elsewhere, Boots Drug were 40s. 3d., Beechams Pills deferred 8s. 3d., and Genatosan 1s. ordinary were quoted at 5s. 6d., following the maintenance of the dividend at 25 per cent. Another good announcement was the resumption of dividends by Midland Tar Distillers with a payment of 5 per cent. Oil shares showed an easier tendency, and "Shell" and other leading issues were lower on balance.

New Companies Registered

Auto-Disinfectors, Ltd. (363,525).—Private company. Capital, £7500 in 5000 5 per cent. participating preference shares of £1 and 50,000 ordinary shares of 1s. Manufacturers and importers of and dealers in disinfectants of all kinds, pharmaceutical, medicinal, chemical, industrial and other preparations, drugs, fertilisers, etc. Subscribers: Fdk. W. Everson, 6 Gibbs Road, Newport, Mon.; Gladys E. Margrie. Manager: D. G. Hall. Solicitor: John O. Davis, Gloucester Chambers, Newport, Mon.

Many firms employing vacuum vessels or receivers find it necessary to vary the degree of vacuum from time to time. A valve specially designed for this purpose is described in a leaflet issued by B.E.N. PATENTS, LTD., High Wycombe.

The joining and repairing of cables by means that are at once scientific and completely practical is an urgent present-day need. Two types of vulcanisers for dealing with single and multiple core cables, either in the workshop or under *in situ* conditions, are described in an illustrated leaflet sent out by HARVEY FROST AND CO., LTD., Bishop's Stortford.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

MORRISON CARPENTER AND CO., LTD., Croydon, isinglass merchants. (M., 26/10/40.) October 1, series of £5000 (not ex.) debentures, present issue £4000; general charge. *Nil. June 7, 1940.

Satisfactions

BRUSH ELECTRICAL ENGINEERING CO., LTD., Loughborough. (M.S., 26/10/40.) Satisfactions October 7, £350 and £840, parts of amount outstanding July 1, 1908.

LEVER BROTHERS AND UNILEVER, LTD., London, E.C. (M.S., 26/10/40.) Satisfactions October 8, of debenture stock registered May 4, 1932, to the extent of £68,800, and of debenture stock registered November 1, 1932, to the extent of £45,763.

County Court Judgments

HARATOX TABLET CO. (firm), 15 Market Street, Manchester. (C.C.J., 26/10/40.) Manufacturing chemists. £20 8s. 6d. July 31.

IR-OX PRODUCTS (firm), Pipe House Wharf, Swansea. (C.C.J., 26/10/40.) Manufacturers of oxides. £21 3s. 8d. August 12.

Companies Winding-Up Voluntarily

THE CWMBRAN CHEMICAL COMPANY, LTD. (C.W.U.V., 26/10/40.) General meeting of the company at the offices of Imperial Chemical Industries, Ltd. (Hut M, Room 10), Black Fan Road, Welwyn Garden City, Hertfordshire, on Thursday, November 7, at 10.10 a.m.

THE BRITISH ALIZARINE CO., LTD. (C.W.U.V., 26/10/40.) General meeting of the company at the offices of Imperial Chemical Industries, Limited (Hut M, Room 10), Black Fan Road, Welwyn Garden City, Hertfordshire, on Thursday, November 7, at 10 a.m.

THE FREDK. CRANE CHEMICAL CO., LTD. (C.W.U.V., 26/10/40.) Harold William Phillips of I.C.I. (Paints), Ltd., Wexham Road, Slough, Buckinghamshire, appointed liquidator.

Private Meeting

(Inclusion under this heading does not necessarily imply failure. Many private meetings are called in order that the debtor may consult his creditors as to his position, without any suggestion of insolvency.)

PHOSPHATES, LTD. (P.M., 26/10/40.) Meeting of creditors at the offices of Messrs. Cash, Stone and Co., chartered accountants, 48 Copthall Avenue, London, E.C.2, on Tuesday, November 12, at 12 noon.

Company News

Cerebos, Ltd., is maintaining its ordinary interim at 10 per cent., less tax.

Lumex Chemical Products, Ltd., of 5 Water Lane, Great Tower Street, E.C.3, have changed their name to Element Products, Ltd.

Genatosan, Ltd., has declared a final dividend on ordinary shares of 15 per cent., making 25 per cent. for the year ended June 30, 1940 (same).

Lawes Chemical Co., Ltd., has declared a final dividend of 6 per cent., less tax, for the year ended June 30, 1940 (last year the same).

Pinchin, Johnson and Co., Ltd., announce an interim dividend of 2½ per cent. on the ordinary shares. Last year's interim was 4 per cent., and there was a final distribution of 6 per cent., less tax.

Erinoid, Ltd., announces a trading profit of £51,480 for the year to July 31, 1940, compared with only £15,368 in the previous year. Meeting, The Factory, Lightpill Mills, Stroud, Gloucestershire. October 30, at 1 p.m.

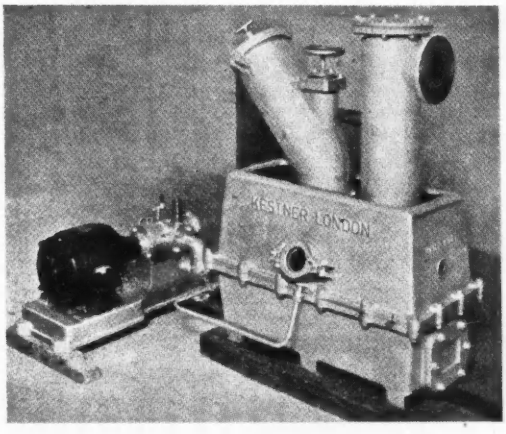
Imperial Smelting Corporation, Ltd., is paying a dividend of 3½ per cent. on the ordinary shares, for the year to June 30, 1940. The last dividend payment (5 per cent., less tax) was made in respect of the year to June 30, 1937.

Chemical Trade Inquiries

Spain.—An agent established at Madrid wishes to obtain the representation of United Kingdom exporters of balsam; agar-agar; bacteriologic peptone; menthol; methyl alcohol; vitreous enamels; stainless steel filament and rennet. (Ref. No. 523.)

Netherlands East Indies.—A firm of agents established at Soekaboemi wishes to obtain the representation of United Kingdom manufacturers of paints, varnishes, coal-tar and lubricating oils. (Ref. No. 524.)

KESTNER SULPHUR BURNERS



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Acid Filtering Unit comprising 1000-gall. lead lined Acid Receiver 10 ft. 3 in. long by 4 ft. 6 in. dia. and lead lined hopper bottom acid filter, with filter bed 5 ft. 6 in. square, outer tank 5 ft. 9 in. square by 3 ft. 5 in. deep.

Jacketed Powder Mixer, with tinned pan 24 in. dia. by 19½ in. deep, mixing blades overdriven through crown wheel and pinion from fast and loose pulleys. FOUR AVAILABLE.

Lead Lined Welded Mild Steel Vessel, 4 ft. 6 in. dia. by 10 ft. 3 in. long, dished ends, manhole and cover, 1000-galls. capacity.

Welded Steel Dephlegmators or Condensers, 12 ft. 6 in. long between tube plates by 3 ft. 0 in. dia. containing 6 in. dia. tubes. Flanged vapour outlet 4 in. dia. flanged liquid inlet, with 3 in. water connections.

Edge Runner Mill, 5 ft. 6 in. dia. by 9 in. deep, steel rollers 42 in. dia. by 10½ in. face, underdriven through machine-cut bevel gear drive from fast and loose pulleys. TWO AVAILABLE.

Lead Lined Benzol Washer, 15 ft. 0 in. dia. by 16 ft. 6 in. deep, with conical bottom 5 ft. 0 in. deep; casing 27 ft. 6 in. high overall; lined throughout 3/16 in. lead; agitator mounted on 3½ in. dia. vertical shaft, driven through machine cut crown wheel and pinion from fast and loose pulley.

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1000 STRONG NEW WATERPROOF APRONS. To-day's value 5s. each. Clearing at 30s. dozen. Also Large Quantity Filter Cloths, cheap. WILSONS, Springfield Mills, Preston, Lancs. Phone 2198.

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'Phone 98 Staines.

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GRINDING of every description of chemical and other materials for the trade with improved mills.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3285 East.

EDUCATIONAL

THE INSTITUTION OF CHEMICAL ENGINEERS.
EXAMINATION, 1941.

APPLICATION forms (returnable 16th December, 1940) and particulars of the Associate-Membership Examination for 1941, together with the Memorandum on "The Training of a Chemical Engineer" may be obtained from the Hon. Registrar, Institution of Chemical Engineers, 56 Victoria Street, Westminster, London, S.W.1.

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